



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/000,626	12/30/97	RENGARAJAN	R 97/P/7971/US

MM21/1016

SIEMENS
INTELLECTUAL PROPERTY DEPARTMENT
186 WOOD AVENUE SOUTH
ISELIN NJ 08830

EXAMINER

TRAN, T

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

10/16/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/000,626

Applicant(s)
Rengarajan et al.

Examiner
Thien Tran

Group Art Unit
2811



☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-23 is/are pending in the application.

Of the above, claim(s) 12-23 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-11 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2811

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of claims 1-11 in Paper No. 5 is acknowledged.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
3. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
4. Figure 3A should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
5. Figure 3B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
6. The drawings are objected to because incorrect reference character 114 has been used to designate a recessed nitride liner in FIG. 6 and FIG. 8. Correction is required.
7. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Art Unit: 2811

Specification

8. The disclosure is objected to because of the following informalities: at page 2, line 2, "vertical surfaces" should be "surfaces". At page 5, line 6, "FIG. 3" should be "FIG. 3A". At page 7, line 14, "downstream" should be "downstream".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "representing a width of a transistor" in claim 1 renders the claim indefinite. The phrase "representing a width of a transistor" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2811

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 8, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurita.

Kurita discloses the claimed trench isolation structure in Figure 2(h) comprising a U-shaped trench 16 in substrate 11, a silicon nitride liner 19 recessed within trench 16, silicon dioxide 22 filled in the trench, and SOG film 32 applied on the top surface and flattened.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-5, 6, 7, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurita.

Regarding claims 1, 3, 4, 5, 9, Kurita discloses a trench isolation structure as described above with silicon dioxide layers 17 and 18 formed under nitride liner 19. See Figure 2(h). Although, Kurita does not specifically disclose that the uppermost surface of the silicon nitride liner 19 lies below a transistor channel depth. Kurita also discloses that the uppermost surface of the silicon nitride liner is disposed at 1000 nm below the substrate surface. Since transistor channel depth (width) is typically about 100 nm (see line 11, page 7 of the application), it is

Art Unit: 2811

obvious that the uppermost surface of the silicon nitride liner 19 of Kurita's device is below the depth of the transistor channel.

Regarding claims 2, 6, 10, Kurita discloses a trench isolation structure as shown in Figure 2(h). Although, Kurita does not specifically disclose a P-FET transistor, it is well known and common practice in the art to use trench isolation structure in the support circuitry with P-FET transistors generally employed.

Regarding claim 7, Kurita discloses a trench isolation structure as shown in Figure 2(h). Kurita, however, does not specifically disclose the oxide fill is tetraethylorthosilicate (TEOS). It would have been obvious to one having ordinary skill in the art at the time the invention was made to select TEOS as a suitable dielectric material for Kurita's device, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References A, B, C, O are being cited since these show an isolation trench with nitride liner.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien Tran whose telephone number is (703) 308-4108.

Application/Control Number: 09/000626

Page 6

Art Unit: 2811

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October 6, 1998

Tom Thomas

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